Winter 1999-2000

NATIONAL WEATHER SERVICE
NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT
TENNESSEE EMERGENCY MANAGEMENT AGENCY
VIRGINIA DEPARTMENT OF EMERGENCY SERVICES

Winter Weather Awareness Week

A Public Awareness Campaign by the National Weather Service and the State Emergency Management Agencies

We are all aware of how hazardous weather can be. Tornadoes strike with unwanted regularity. Severe thunderstorms with down burst winds and large hail occur even more frequently. Floods and flash floods can wash people and property away with little notice.

The National Weather Service and the State Emergency Management Agencies would like to bring another weather threat to the forefront and heighten everyone's awareness of this significant weather threat – Winter Weather.

The winter of 98-99 was relatively mild across the region with the climatic affects of La Niña. Even with this mild winter, some areas had significant winter weather, shutting down roads and interstates for periods of time. The Christmas Eve 1998 ice storm caused over 17 million dollars of damage and widespread transportation problems. The winter of 95-96 saw many areas of the Southeastern U.S. experiencing a number of very heavy snow and ice storms. Heavy snow or ice can trap people in their homes or automobiles. People are inconvenienced, injured or even killed. Even without snow or ice, intense cold can injure or kill before a person is aware they are at risk. Fatalities from hypothermia have occurred in air temperature of 40-50 degrees. Persons with certain chronic health conditions and those over 65 area more at risk for hypothermia, even within the home.

One hazard we do not often associate with winter is flooding. Floods occur when too much rain or melted snow fill river or creek basins too quickly. Along Tennessee's rivers and streams, flooding is a natural part of life and most common during winter and early spring. Frozen ground, sparse vegetation, and less evaporation are all factors that allow water to run off the land and reach the rivers quickly during the cold months.

The National Weather Service and the State Emergency Management Agency have selected November 16th, 17th and 18th to bring these hazards to the attention of the public. We will be sending information through our communications network including the National Weather Service's NOAA Weather Radio during this period. We hope you will all join in this effort to make this the safest winter possible.

A Word from Jerry McDuffie, Meteorologist in Charge

As the Meteorologist in Charge (MIC) of the Warning and Forecast Office at Morristown, TN.; I would like to wish all of you the very best as we move toward the holidays and the new Millennium. As always, weather plays a big part in our day to day lives. We, at WFO Morristown, will continue to provide the very best forecasts and support that we can for your daily activities. The weather this winter will be a little more normal, it appears. We will continue to have a La Nina pattern affecting our weather; however, this La Nina is weaker than last winter. (See page 4 for more details.) We have been somewhat pampered by the last 3 mild winters. Most likely, we will see more snow events and a few cold events during this winter. Normally, we get most of our snow in January, February, and March. We usually get severe convective storms in March, April and May; although, it is not

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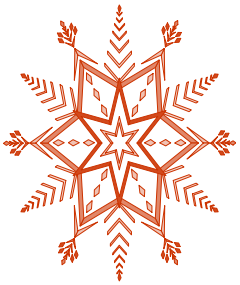
Special points of interest:

- **Snow and Freezing Rain can immobilize a region for days...be prepared**
- **Flooding is the number one cause of weather related deaths...don't be a statistic**
- **Know what to do before a winter storm strikes**

Snow and Freezing Rain

Heavy snow and/or freezing rain can immobilize a region and paralyze a city. Accumulations of snow can collapse buildings and knock down trees and power lines. Rural areas may be isolated for days. It is recommended that each household have provisions and the ability to remain self-sufficient for at least 3 days without power, or help, as it may take this long to reopen main roads and reestablish vital services



Wind Chill

Wind Chill is based on the rate of heat loss from exposed skin caused by combination effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature.

Animals are also affected by wind chill. The biggest question that always comes up with wind chill is, does it affect water pipes and car radiators. The answer is no, the accelerated lose of heat occurs on exposed skin only.

During the Blizzard of 93, most of East Tennessee was completely Immobolized for nearly a week.

Hypothermia

Warning Signs – Uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and apparent exhaustion.

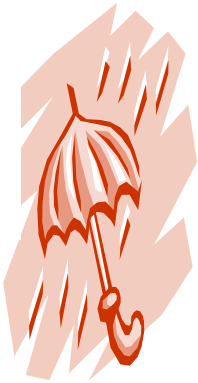
Detection – Take the person's temperature. If below 95°F, immediately seek medical care. This is a life threatening situation.

If care is not immediately available, begin warming the person slowly. Warm the core first. Get the person into warm clothing and wrap them in a warm blanket covering the head and neck. Do not give the person alcohol, drugs, coffee, or any very hot beverage or food, warm broth is better. Do not warm the extremities first, this drives cold blood toward the heart and may cause heart failure.

For Hypothermia Cases, Warm the CORE of the body before the extremities.

Frost Bite

Frostbite is damage to body tissue caused by the tissue being frozen. Frostbite causes the loss of feeling and a white or pale appearance in extremities, such as fingers, toes, earlobes, or the tip of the nose. If symptoms are detected, get medical help immediately. If you must wait for help, slowly re-warm affected areas. If the person is also showing signs of hypothermia, warm the body core before the extremities.



Flooding

Flooding is the number one weather killer in the United States annually. Whether or not you live in a flood prone location, you will likely still be affected by flooded roads, or power and water outages from flooding during the next year. Most people killed in flooding die in their vehicles. NEVER drive into flooded roads. One foot of running water is enough to sweep away most cars. If flooding begins to affect you in your car, abandon it immediately and head for higher ground. You should keep at least three days' worth of clothes, non-perishable foods and medications, and personal supplies on hand for each person in your family, in case flooding affects your home. Store these supplies in a sturdy wa-

A Carter County Home – After the Flood, January 8, 1998

Flooding in 1998 caused more deaths (12) in Tennessee than Tornadoes, Severe Thunderstorms and excessive heat combined (9).

Before the Storm

1. Know the terms – A Winter Weather Advisory is issued when ice and snow are expected to hinder travel, but anticipated conditions are not serious enough to require warnings.

Freezing rain is forecast when expected rain is likely to freeze as soon as it strikes the ground, potentially creating a coat of ice on roads and walkways.

Sleet consists of small particles of ice mixed with rain. Sleet causes roads to freeze and become slippery.

A winter storm watch means that severe winter weather is possible within the next day or two.

A blizzard warning means that heavy snow and winds of 35 miles per hour or more are expected.

2. Be prepared – Keep a battery powered radio and flashlights in working order, stock extra batteries.

Store drinking water and have food that can be prepared without an electric or gas stove.

Stock emergency water and cooking supplies.

Have candles and matches available in case of a power outage. Be careful how you use them.

Be certain that needed medicines are available.

3. Be prepared for isolation at home – Make sure you have sufficient heating fuel; regular fuel sources may be cut off.

Have some kind of emergency heating equipment and fuel so that you can keep at least one room warm, but do **NOT** us a gas fired grill inside the home.

Take measures to protect plumbing from freezing. Contact local utilities for winter tips.

4. Keep your car or truck "winterized." Winterizing should include being certain about antifreeze protection levels and use a gasoline additive to reduce gasoline freezing. Carry a "Winter Car Kit" that includes high energy foods, a windshield scraper, a flashlight, a tow rope or chain, a shovel, tire chains, a blanket, a bag of sand or salt, a fluorescent distress flag and an emergency flare – all in case you're trapped in your vehicle by a winter storm. Keep extra gloves, mittens, hats, earmuffs and outerwear in the vehicle throughout the winter.

During the Storm

Stay Informed – Listen to radio or television for updates on weather conditions. With early warning, you may avoid being caught in the storm, or at least be better prepared to cope with it.

Dress for the season: Avoid Getting Wet Many layers of thin clothing are warmer than single layers of thick clothing. Mittens are warmer than gloves. Wear a hat; most body heat is lost through the top of the head. Cover your mouth with scarves to protect lungs; don't directly inhale extremely cold air.

Overexertion can bring on a heart attack – a major cause of death during and after winter storms. If shoveling snow isn't critical, don't do it. If you must shovel, don't overexert yourself.

If you are isolated at home: Conserve fuel by keeping your house cooler than usual and by "closing off" heat to some rooms. When kerosene heaters are used, maintain ventilation to avoid toxic fumes. Use only the fuel recommended by the manufacturer and follow operating instructions. Use a carbon-monoxide detector/alarm and a smoke alarm.

Do Not Drive Into Worsening Conditions: If you must travel, take winter driving seriously. Travel by daylight, and keep others informed of your schedule. Drive with extreme caution. Never try to save time by driving fast or by using back-road shortcuts.

If a BLIZZARD traps you in your Vehicle: Pull off the highway, stay calm and remain in your vehicle where rescuers are most likely to find you.

Set your directional lights to "flashing" and hang a cloth or distress flag from the radio antenna or window.

Do not set out on foot unless you can see a building close by where you know you can take shelter. Be careful: distances are distorted by blowing snow. A building may seem close, but actually may be too far away to walk to in deep snow.

If you run the engine to keep warm, open a window slightly for ventilation. This will help protect you from possible carbon monoxide poisoning. Periodically clear away snow from the exhaust pipe.

Exercise to maintain body heat, but avoid overexertion. In extreme cold, use road maps, seat covers, and floor mats for insulation. Huddle with passengers and use your coats as blankets.

Never let everyone in the car sleep at one time. One person should always be awake to look out for rescue crews.

Be careful not to use up all battery power. Balance electrical energy needs – the use of lights, heat and radio with supply.

At night, turn on the inside dome light, so work crews can spot you.

If in a remote area: Spread a large cloth or the vehicle floor mats on the snow to attract rescue personnel who may be surveying the area from above. Once the blizzard passes, you may need to leave the car and proceed on foot to better shelter.

Keeping in touch...After a Disaster

After any disaster, friends, relatives, insurance adjusters, etc. may need to locate you and your family. The following tips may reduce the confusion associated with making contact:

1) Before evacuating your home, establish an contact person (and phone number) out of the potential disaster area where friends and relatives should "check-in" with each other.

2) When you evacuate, consider leaving a note, securely attached to the front door, telling where you can be reached – but only if you have reason to believe someone might come looking for you.

3) If widespread damage occurs, insurance adjusters or others might have trouble identifying your home or finding you. After the danger is over, therefore, consider spray printing the following information somewhere that is highly visible from the street: Name, address, insurance company, policy number, contact telephone

If leaving your home, establish a contact point.

Wind Chill Chart

Temperature

WIND SPEED	0	35	30	25	20	15	10	5	0	-5	-10	-15	-20
5	32	27	22	16	11	6	1	-5	-10	-15	-20	-26	
10	22	16	10	4	-3	-9	-15	-21	-27	-33	-39	-46	
15	16	9	2	-5	-11	-18	-25	-31	-38	-45	-52	-58	
20	11	4	-3	-10	-17	-24	-32	-39	-46	-53	-60	-67	
25	8	0	-7	-14	-22	-29	-37	-44	-51	-59	-66	-74	
30	5	-2	-10	-18	-25	-33	-40	-48	-56	-63	-71	-79	
35	4	-4	-12	-20	-28	-35	-43	-51	-59	-66	-74	-82	
40	2	-6	-13	-21	-29	-37	-45	-53	-61	-69	-77	-85	

Wind Chill is the effect on bare skin, it does not affect water pipes, or car radiators. Mittens work better than gloves to protect the hands

La Niña

We have all become familiar with the terms La Niña and El Niño over the past few years. These terms are used to describe sea surface temperature anomalies in the tropical Pacific Ocean. El Niño is the term used when ocean temperatures are warmer than normal, while La Niña is used when temperatures are cooler than normal. These deviations in the sea surface temperatures affect the atmospheric steering currents which, in turn, produce abnormal weather patterns around the world. El Niño events result in cooler temperatures and above normal rainfall over the southern U.S., while the northern U.S. experiences warmer and drier than normal weather. The reverse occurs for La Niña events. The southern U.S. remains warmer and drier, while the northern states, temperatures are below normal with above normal precipitation.

During La Niña events, a second event, the North Atlantic Oscillation (NAO), helps determine which end of extremes the Tennessee Valley experiences. The winter of 1995/96 is a good example of La Niña and a negative NAO while this past winter (1998/99) is a good example of a La Niña and a positive NAO. If you remember 1995/96 you will remember higher than normal snowfall amounts and events, while last year was mild with below normal snowfall. The official forecast for this winter for the Ohio and Tennessee Valley's includes an increased number of heavy precipitation events and a greater risk of severe winter weather.

Multiple layers protect better than a single layer

The Voice of the National Weather Service

NOAA Weather Radio

NOAA Weather Radio provides warnings, watches and forecasts directly from the National Weather Service. A number of changes have been made to the NOAA Weather Radio over the past few years. The first change was in the tone alert system. Older radios still receive the single tone alert and activate for any warning over the listening area. Newer radios equipped to decode the Specific Area Message Encoding or SAME tones can be activated for a single county, or up to 15 counties.

The next big change the Weather Service made in NWR was the Console Replacement System. This system will take the text messages issued by the NWS, including forecasts and eventually warnings, and the computer will automatically generate a voice message to be transmitted over the radio. Saving lives often comes down to seconds, and the automation of messages will cut valuable seconds off the transmission time needed from when the message is issued to the time it is alarmed and transmitted over the air. Other changes are planned for the NWR, the next being a change in the automated voice for easier understanding.

All these changes are in line with the Weather Services mission of protecting life and property.

New SAME Radios can alert for a single county

NOAA Weather Radio SAME Codes for East Tennessee Transmitters

Chattanooga
162.550 MHZ

Bledsoe	047007
Bradley	047011
Hamilton	047065
Marion	047115
McMinn	047107
Meigs	047121
Monroe	047123
Polk	047139
Rhea	047143
Sequatchie	047153

Georgia

Catoosa	013047
Chatooga	013055
Dade	013083
Gordon	013129
Murray	013-213
Walker	013295
Whitfield	013313

Knoxville
162.475 MHZ

Anderson	047001
Blount	047009
Campbell	047013
Claiborne	047025
Cocke	047029
Grainger	047057
Hamblen	047063
Jefferson	047089
Knox	047093
Loudon	047105
Monroe	047123
Morgan	047129
Roane	047145
Scott	047151
Sevier	047155
Union	047173

Tri-Cities
162.550 MHZ

Carter	047019
Greene	047059
Hancock	047067
Hawkins	047073
Johnson	047091
Sullivan	047163
Unicoi	047171
Washington	047179

Virginia

Lee	051105
Russell	051167
Scott	051169
Smyth	051173
Wise	051195

North Carolina

Ashe	037009
Avery	037011
Madison	037115
Mitchell	037121
Watauga	037189
Yancy	037199

NOAA Weather Radio... Provides severe weather watches and warnings DIRECTLY from the local National Weather Service office.

Seconds can make a difference...get the warning day or night by NOAA Weather Radio

Severe Weather, 1999

Rich Pollman

This table indicates how the NWS at Morristown performed from January 1st through September 30th. The table only includes warnings and reports of Severe Thunderstorms and Tornadoes. The table lists the number of warnings issued for each county, the number of warnings that were verified with your spotter reports, the lead time, and the number of missed events. The lead time can be described as the time between when we issue a warning to when we received the first report from the spotters. A missed event is when a spotter report comes into the NWS office, but we don't have a warning out at that time.

The last line lists the total for this year for the entire County Warning Area (CWA). For 1999 we detected 90% of all severe weather, and had a False Alarm Rate of 24% on our warnings. This puts our Critical Success Index at 70%.

The severe weather season started early on January 17th and 18th when a squall line move into the MRX CWA from West and Middle Tennessee. East Tennessee experienced large hail up to golfball size, and some wind damage. West and Middle Tennessee did not fare as well. Numerous tornadoes touched down on the 17th with 9 deaths. Following very closely on January 21st, another severe weather episode developed in West Tennessee which caused another 3 deaths. The early part

County	Number of Warnings	Warnings Verified	Lead Time (minutes)	Missed Events
Anderson	6	6	20.4	1
Bledsoe	8	6	13.2	0
Blount	14	11	10.9	2
Bradley	8	6	12.0	3
Campbell	6	5	21.3	0
Carter	1	1	46.0	1
Claiborne	6	4	16.4	1
Cocke	7	2	14.5	0
Cherokee, NC	6	4	17.6	0
Clay,NC	6	3	17.7	0
Grainger	9	5	16.7	1
Greene	9	6	20.5	0
Hamblen	10	10	15.5	1
Hamilton	12	9	17.0	2
Hancock	5	3	30.7	0
Hawkins	10	8	17.1	0
Jefferson	11	11	12.2	3
Johnson	2	2	21.5	0
Knox	18	14	13.2	1
Loudon	7	7	20.7	0

County	Number of Warnings	Warnings Verified	Lead Time (minutes)	Missed Events
Lee,VA	3	3	34.3	0
McMinn	7	6	21.1	1
Marion	7	6	21.8	1
Meigs	8	5	21.4	0
Monroe	10	6	17.7	0
Morgan	7	7	21.6	0
Polk	9	7	15.9	1
Rhea	9	6	18.5	1
Roane	5	4	27.8	0
Scott,TN	6	5	25.0	0
Sequatchie	3	2	14.0	2
Sevier	11	10	18.1	0
Sullivan	8	5	10.1	1
Russell,VA	2	2	11.7	1
Scott,VA	1	1	21.0	0
Unicoi	2	0	N/A	0
Washington, TN	5	3	10.8	2
Washington, VA	4	3	16.5	0
Wise, VA	4	2	27.0	0
CWA TOTAL	**280**	**213**	**17.1**	**25**

From the MIC (continued from Page 1)

uncommon to get some severe thunderstorms or possibly a tornado in the January and February period. One severe weather occurrence that is common to the winter months is flooding. Rainfall and snowfall increase during these months while the use of water by vegetation comes to a halt. This means that more water runs off into the creeks and rivers.

It is very important for everyone to know what to do when these types of severe weather occur. Please have a plan of action ready. Talk with your children and ensure each family member knows where to go and what to do. In the event of flooding, heed the advice and directions of emergency crews. They are usually out there risking their safety to provide other citizens vital information.

Get a Weather Radio. If you do not have a weather radio, be sure and listen to local stations on your regular AM/FM radios or TV. If there is bad weather in the area, be sure and tune away from sources that would not broadcast watches and warnings. If you are listening to CDs, watching a video tape, or such; you will not know of any warnings. We hope you find the information contained within this pamphlet informative and worthwhile. There are several groups and agencies that work together with the NWS to help our citizens remain safe... Tennessee Emergency Management Agency (TEMA), including law enforcement, 911 centers, EOCs, fire departments, etc. and radio/TV/newspaper media. We greatly appreciate their efforts.

Severe Weather, 1999 (continued from page 6)

of spring was exceptionally quiet, with no warnings issued in February and March, and only 13 in April. Then on May 5th and 6th another squall line moved through east Tennessee and caused over $272,000 dollars worth in damages.

(continued on page 7)

That was the start of a very active month, including widespread severe weather events on May 7th with hail up to golfball size and wind damage in Knox, Hancock, and Lee counties, and May 13th with hail again up to golfball size and wind damage in White Pine. June 2nd another severe weather event across the central and northern valley regions with mainly tree damage from straight line winds. There were several days during July and August with widespread "pulse" severe thunderstorms including July 6th, 7th, 24th, 27th, 28th and 29th, as well as August 1st, and 23rd. Most of the severe weather associated with these events was isolated wind damage of trees and a couple of roofs.

Despite the events listed above, it was a fairly quiet severe weather season for the MRX CWA. Through October 15th, there have been no tornadoes in the CWA. This marks the first time since 1988, that the CWA went a year without a tornado. The 280 warnings through September 30th is the lowest total for MRX since we took over responsibility in 1995. The previous low was 326 warnings in 1996. Of course, we still have get through November and December.

Web Page Changes

The NWS Morristown web page, **www.srh.noaa.gov/mrx,** is no different than any other web page, it is always being updated and improved. Recently the Skywarn web page was updated with several new features. You can now submit spotter reports through the web page. However, the reports that you submit should not be time sensitive reports such as on going severe weather (3/4 inch diameter hail, 58 mph or greater winds, or a tornado). Reports through the internet can take several hours to reach the mailbox. Therefore, submitted reports should be storm damage, long fused events (snow, ice accumulations, rainfall amounts, etc.), and "day old" severe weather reports.

A listing of upcoming Skywarn training sessions is also on the Skywarn web page. The training classes listed on the web page will only be the sessions that will be open to the general public.

There will be short reports on severe weather events under the "Significant Severe Weather Events" link. Currently only the squall line event of May 5th and 6th is on the web page.

Finally, there are several links to items that interest spotters. There are links to spotter brochures, other safety brochures and NWS publications, severe weather outlooks, and other spotter groups.

NATIONAL WEATHER SERVICE
NORTH CAROLINA DIVISION OF
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We're on the Web
www.srh.noaa.gov/mrx

Winter Climatology around the region

All Time Cold Temperatures

Chattanooga	-10 Feb 13, 1899; 1/21/1985
Knoxville	-24 Jan 21, 1985; 1/31/1966
Tri-Cities	-21 Jan 21, 1985

Coldest Average Winter

Chattanooga	34.8	1962-63
Knoxville	34.2	1963-64
Tri-Cities	30.0	1976-77 and 1977-78

Coldest monthly average

	DEC	JAN	FEB
Chattanooga	34.3 in 1917	28.5 in 1977	33.8 in 1895
Knoxville	29.2 in 1876	26.7 in 1940	30.5 in 1895
Tri-Cities	27.8 in 1963	22.1 in 1977	28.1 in 1958

SNOWFALL

Seasonal

Chattanooga	23.9 in 1894-95
Knoxville	56.7 in 1959-60
Tri-Cities	51.0 in 1959-60

Monthly

	DEC	JAN	FEB	MAR
Chattanooga	14.8/1886	15.8/1883	17.3/1895	20.0/1993
Knoxville	25.4/1886	15.1/1962	25.7/1895	20.2/1960
Tri-Cities	12.9/1963	22.1/1966	20.4/1979	27.9/1960

24 Hour

	DEC	JAN	FEB	MAR
Chattanooga	12.0/1886	10.2/1988	8.7/1960	20.0/1993
Knoxville	8.9/1969	12.0/1962	17.5/1960	14.1/1993
Tri-Cities	9.6/1969	9.7/1955	10.7/1969	14.2/1993